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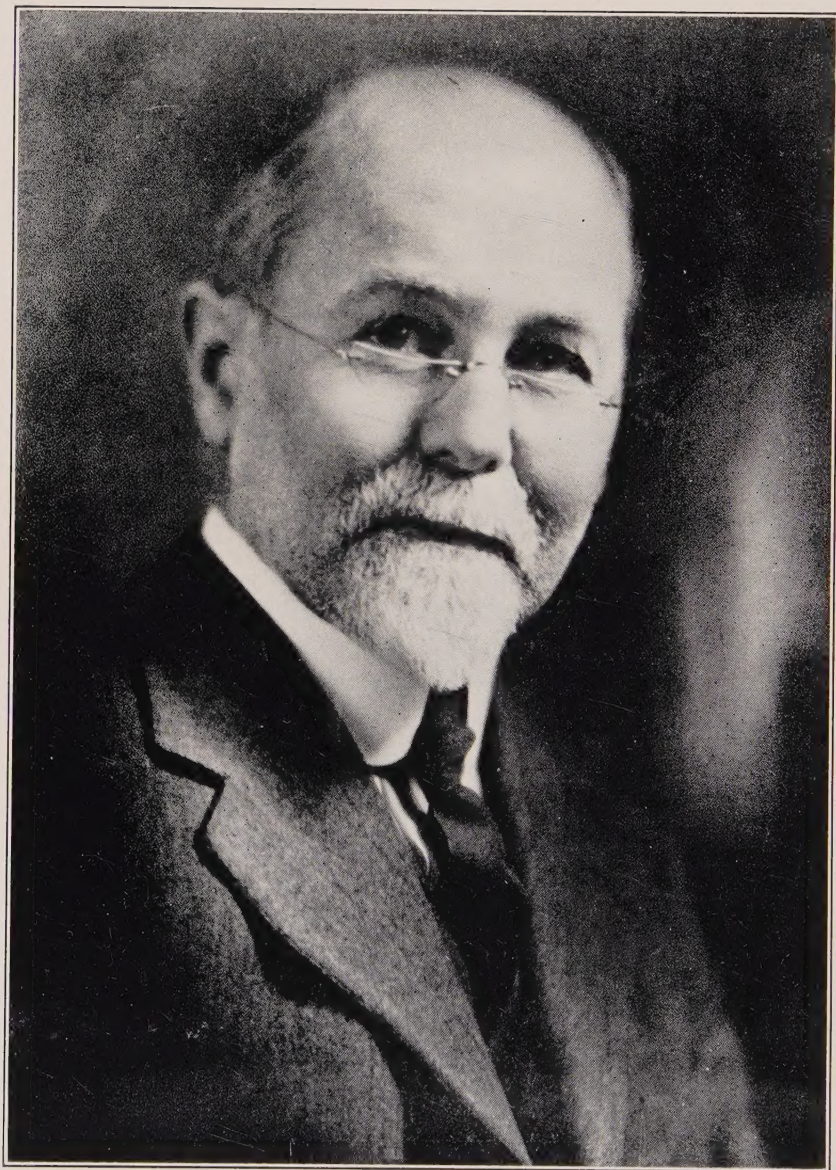
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MERRITT LYNDON FERNALD 1873-1950

ARTHUR STANLEY PEASE

MERRITT LYNDON FERNALD was born October 5, 1873, at Orono, Maine, where his father, Dr. Merritt Caldwell Fernald—later to become the first and third president of the Maine State College of Agriculture and Mechanic Arts (now the University of Maine)—was head of the Department of Mathematics and Physics. His mother was Mary Lovejoy (Heywood) Fernald, and he had three brothers and one sister.

After a boyhood of hard work, tending the garden and the furnace, shingling the roof, and walking a mile and a half to school, he graduated from the Orono High School, and entered in 1890 as a freshman at the State College. Soon after this appeared what seems to be the first of his long series of botanical publications, a modest little note on two *Carices* (*C. deflexa*, var. *Deanei*, and *C. chordorhiza*) in the *Bulletin of the Torrey Botanical Club*, xvii (1890), 261, followed in xviii (1891), 120-124, by a list of *Plants of special interest collected at Orono, Maine*. In this he states that he had collected there from May to August, 1890, and mentions other collections in 1889, e. g., at Cape Elizabeth, Me. Certain other plants are cited as having grown in particular localities "ever since I can remember." He names in this list nearly seventy species, many new to the state, and says that about 81 species of *Carex* are found in Maine. (Not so bad for a boy of seventeen!)

Perhaps as a result of these articles and also because of a letter¹

¹The correspondence mentioned between the two Fernalds and Sereno Watson is preserved at the Gray Herbarium.

which he wrote to Sereno Watson on January 30, 1891 (misdated 1890) about a *Juncus* (*J. bufonius*) which he thought was not adequately described in *Gray's Manual*, Watson, then Curator of the Gray Herbarium, wrote to him on February 4, 1891: "I have been much pleased with the intelligent interest that you have shown in the plants of your region. I have no idea what your plans or expectations for the future may be, nor even of your age or how far advanced you may be in your education. But at a venture I would say that if a career as a botanist has attractions for you there is an opportunity open here for a young man who is willing to begin at the bottom and work his way upward . . . Opportunity will be given for study and advancement and compensation sufficient at least for support. If such a position has any attraction for you I shall be glad to hear from [you] in reply." On February 7, President Fernald, who apparently had had some acquaintance with Watson "at Miss Parker's," expressed his surprise at the offer, since the boy was but seventeen. He had graduated, his father wrote, from the Orono High School, with two years of Latin and one of French, and "before entering this college he was allowed one year which he devoted quite largely to Botany in the field." His father wished the boy to have a well-rounded education, and with this wish Watson's reply agreed, emphasizing the importance of a reading knowledge of Latin, French, German, and some Greek, and suggesting that young Fernald might carry two academic courses a year and work half time in the herbarium, especially in distributing new accessions. On February 7, young Merritt wrote to Watson that the position outlined certainly did attract him, for "I think the one thing I was made for was a botanist, as from early childhood my inclinations have been in that line." Accordingly on March 6, 1891, President Fernald brought his boy down to Cambridge, and ensconced him as an assistant at the Gray Herbarium, his connection with which was destined to continue unbroken for nearly sixty busy years.

In April, 1892, Fernald completed the second edition of the *Portland Catalogue of Maine Plants*, a bare list with a brief preface over his own name. In two supplements (1895 and 1897) he showed more developed critical judgment and furnished more exact citation of his own and others' collections. Meantime, in

the autumn of 1891, he had entered the Lawrence Scientific School, in which he spent the period from 1891 to 1897, when he graduated as S. B. *magna cum laude*. (His later close associate, C. A. Weatherby, became a Bachelor of Arts the same year.)

In a class report Fernald describes himself a a "mere grind," held back by shyness from social activities, and hence not a "club-man," save for membership in the Maine Club, the Harvard Society of Natural History (where the writer first met him in 1898), and the Harvard Folklore Society. On September 16, 1891, moreover, President Fernald, in writing Sereno Watson, speaks of his son's diffidence, but thinks that it will "wear away as he comes to feel more and more at home."

His academic progress was gradual, as assistant from 1891-1902, instructor from 1902-1905, assistant professor of botany from 1905-1915, and, from 1915-1947, Fisher Professor of Natural History (the chair once occupied by Asa Gray and George L. Goodale), becoming in 1947 Fisher Professor Emeritus. In addition, from 1935-1937 he was Curator, and from 1937-1947 Director of the Gray Herbarium. With W. L. W. Field, Ralph Hoffman, and Hollis Webster, he helped to establish the Alstead (N. H.) School of Natural History, teaching in it during the summers from 1899 to 1901. In 1899 he became associate editor of RHODORA, and in 1928, succeeding B. L. Robinson, its editor-in-chief, and under his vigorous management the scope and the bulk of the journal was strikingly increased.

Young Fernald came to Harvard with a natural bent toward botanical study which he had followed since childhood, and when fifty years out of college he reaffirmed his belief that natural scientists are born, not made "in the laboratory, the place which usually deadens such interest." Though as he matured in experience and broadened in his outlook he came to respect and emphasize more and more the historical aspects of systematic botany, yet he often expressed rather scornful feelings toward those "closet botanists," who, through physical weakness or mere indolence, had no ambition to familiarize themselves with plants in their natural setting in the field. "Botanists who don't know plants," he liked to call such.

His own professional aims Fernald well expressed in his class report for 1922: "I am attempting to attain and record as exact

an understanding as possible of the natural flora of this region [Hudson Strait to Long Island and the Great Lakes] and the geological and geographic conditions of the past under which the plants (and with them the animals) have reached their present habitats; and, consequently, I am repeatedly forced to explain to the man in the street, my failure to enter a money-making profession . . . I belong to that almost extinct species, the old-fashioned systematic botanist." This phytogeographic interest largely shaped the course of his field activities. Starting at Orono, expanding to such parts of Maine as he could reach before the days of automobiles, including especially Mt. Bigelow (August, 1896, with J. F. Collins and Professor W. C. Strong of Bates College), Mt. Katahdin, and the Saint John and Aroostook valleys, he expanded his scope to include the areas about the Gulf of St. Lawrence—Bic, Gaspé, Newfoundland, southern Labrador, and the Magdalen Islands—and Nova Scotia. Many were the new species and noteworthy extensions of range detected on these expeditions, but of even greater significance seemed the theories of plant-distribution arising as generalizations from them, whether concerned with the extension of coastal-plain plants from New Jersey to Cape Cod, south-western Nova Scotia, and the Avalon Peninsula, or the notable persistence of supposed relic species of a preglacial period in and about unglaciated areas from the Gulf of St. Lawrence westward, or the control of plants by the chemical constituents of their soils. It is significant of this interest that, when I asked him, a few weeks before his death, to what studies he would apply himself when the new edition of *Gray's Manual* was completed, he replied that he had in prospect a large work on plant-distribution, collecting, revising, and integrating his various scattered articles on coastal, alpine, and other groups.

Fernald's summer expeditions, carefully planned and accompanied by both expert and amateur assistants, are remembered by those who were fortunate enough to participate in them as physically strenuous and sometimes excitingly adventurous, and it comes as a surprise to one who has seen him battling with the scrub on a pathless Gaspesian mountain or enduring the hardships of the northern Newfoundland coast to read in his fifty-year report that from early childhood a weak heart was always his

handicap. At Harvard the college physician had cautioned him against strenuous effort. "However," writes Fernald, "when I invited him to join me on a camping trip in Northern Maine, I spent my time exploring the mountains while he lay all day in the hammock. Shortly after that he succumbed." Later, when heart trouble prevented further mountain explorations in the northeast, he could find in tidewater Virginia enough of hard work and long hours to test any companions save the most seasoned, and enough thrilling experiences to show that the field was far from exhausted. The journals of his various trips, recorded in the pages of *RHODORA*, indicate that his keen discrimination, his feeling for the human interest in botanical adventure, and his ever playful sense of humor, might have produced some very readable books of travel, had he had the time to give to such writing.

Fernald's powers of observation were keen and quick, until, in his later years, cataracts obscured his vision, but, though slowing up his rate of work, did not shorten his hours of labor. With a remarkable memory for the normal characters and the habitual ranges of thousands of species, he was prompt to detect any variation, and clear and accurate in describing it. It was not enough, moreover, to describe a new plant, but it must be carefully differentiated from its nearest congeners; consequently his experience in "keying up" new species stood him in good stead in preparing the full keys in the eighth edition of *Gray's Manual*.

In 1908 he collaborated with Professor B. L. Robinson in writing the seventh edition of the *Manual*; in 1943 with Professor A. C. Kinsey he published *Edible Wild Plants of Eastern North America*; and, finally, in the summer of 1950, after an interval of forty-two years, appeared the long-expected and monumental eighth edition of the *Manual*, in large part his own work during that period. It is a cause for thankfulness that his sudden death (September 22, 1950) did not occur until after this *magnum opus* had been safely published. Beside these books he had written over seven hundred and fifty papers and memoirs, many of them of considerable length.

Though Fernald belonged to no social club (save the Harvard Faculty Club), he was connected with many professional societies the New England Botanical Club (president 1911-1914);

the American Society of Plant Taxonomists (president 1938); the Botanical Society of America (vice-president 1939, president 1942); the American Association for the Advancement of Science (vice-president 1941); the Societas Phytogeographica Suecana; the Linnaean Society (London); the Botanical Society and Exchange Club of the British Isles; and the Torrey Botanical Club. He was a fellow of the American Academy of Arts and Sciences; the American Philosophical Society; a member of the National Academy of Sciences; a corresponding member of the Academy of Natural Sciences (Philadelphia), the Société Linnéane de Lyon, and of the Norske Videnskaps Akademi; a member of the International Committee on Botanical Nomenclature (1930-1935) and the Association of American Geographers, and various other organizations. He was awarded the honorary degree of D. C. L. by Acadia University (1933) and that of D. Sc. by the University of Montreal (1938); also the Leidy Gold Medal of the Academy of Natural Sciences at Philadelphia (1940), a Gold Medal from the Massachusetts Horticultural Society (1944), and the Marie-Victorin Medal, given by the Foundation Marie-Victorin for outstanding services to botany in Canada (1949).

In 1907 he married Miss Margaret Howard Grant of Providence, R. I., who, with one daughter Katherine (Mrs. H. G. Lohnes), one son, Henry Grant Fernald, and six grandchildren, survives him. A second daughter, Mary, died in 1927.

What Fernald's friends and even casual acquaintances will remember about him is not, however, his official positions and honors nor even the bulk of works which he produced, but the unforgettable personality of the man. Tireless in labor, vigorous in expression, fearless and outspoken in controversy or criticism—sometimes embarrassingly so—he yet had a real appreciation and respect for honest work of others and the power, by suggestion and commendation, of stimulating in them—especially in students and those not too set in their own ways and conceits—an enthusiasm for research and discovery. Though he never wore his heart upon his sleeve he had a deep respect for sincere moral character, and though scientists are sometimes accused of impersonal stolidity, of all his sayings I like best to remember that once, in reply to a thoughtless youthful remark of mine that a certain investigation, even if carefully pursued, could have only

a sentimental value, he said, with a good deal of feeling, "This world would be a pretty poor place if there were no sentiment in it."

FERNALD AS A TEACHER

JOHN M. FOGG, JR.

It was through the medium of his writings that I first became acquainted with Merritt Lyndon Fernald. As a beginning student in Systematic Botany, I early discovered the bound set of *RHODORA* in our Departmental Library and, starting with Volume I, set myself the task of reading every number of this Journal and preparing my own card index of all new species, varieties and combinations, with cross references to significant range extensions, local floras and items relating to plant geography. It was in this manner that I formed a high and lasting regard for Fernald's botanical scholarship, his careful and precise use of English, and, above all, his intimate and critical knowledge of the flora of Eastern Temperate North America.

As I read his paper on "The Plants of Wineland the Good," studied his revisions of difficult taxonomic groups, devoured his discussions of glaciation, Post-Pleistocene land bridges and nunataks, and, above all, avidly consumed his accounts of field work in Nova Scotia, the Gaspé Peninsula and Newfoundland, I conceived an intense desire to meet the author and especially to have the privilege of accompanying him on a botanical expedition. The realization of both these wishes I owe to my good friend, Mr. Bayard Long, who somehow succeeded in persuading Fernald to invite a young botanist at the University of Pennsylvania to join Long and him on a brief field trip to Newfoundland late in the summer of 1926, following the Fourth International Botanical Congress at Ithaca.

It was on this expedition, the first of many, that I came more fully to appreciate the dynamic qualities which made Fernald the greatest student of our eastern flora since Asa Gray. Our assignment on four short weeks in the field was divided between exploring the country around Lark Harbor on the west coast of Newfoundland and collecting on the granitic barrens of the south coast near Burgeo. Those favored students who have been with

Fernald in the field need not be reminded of his indefatigable energy, his keenness of perception, and his uncanny ability for recognizing significant variations. To me, one of the most delightful features of this experience was what came to be known as "the bed-time story." After the day's collections were safely in press, and often by the flickering light of an oil lamp, it was our invariable custom to gather around while Professor Fernald, with the aid of his homemade check list, ran through and entered the finds of the day, with a running comment on the distributional vagaries of the plants concerned and illuminating observations on botanists past and present. In these informal sessions a multitude of new species and varieties was conceived, some of them to be born later in the pages of RHODORA, others falling by the wayside as their characters were subsequently shown to be too trivial for recognition. It was in this manner that I first realized the full stature of Fernald as a preceptor. His seemingly inexhaustible supply of information concerning taxonomic literature, his remarkably tenacious memory, his capacity for seeing the forest as well as the trees, all combined to make of him a superbly interesting and stimulating teacher.

It was on this expedition that I first took up with Professor Fernald the matter of my coming to the Gray Herbarium to pursue my doctoral dissertation under his supervision. His advice, for which I am everlastingly grateful and which I consider valid for all graduate students, was that instead of accepting an assistantship or a teaching fellowship, I should arrive unencumbered by any obligation other than to devote myself full time to my problem. When, therefore, I presented myself at the Gray Herbarium in the autumn of 1927, I had completed my formal program of graduate course work and was, for a year at least, financially independent. I was thus divorced from the necessity of taking courses, although, at Fernald's suggestion, I "listened in" on his undergraduate course in Systematic Botany, as well as his famous Botany 10 (Classification and Distribution of Flowering Plants; Advanced Studies on Special Topics). The first of these provided an interesting revelation of Fernald's classroom technique. Following a key to seed plants which he had constructed, and which with some modifications has found its way into the Eighth Edition of Gray's Manual, Fernald took

up in his lectures the families of Spermatophytes, beginning with the Pinaceae. After elucidating familial and generic characters, our lecturer proceeded to discourse upon the more significant species, pointing out their distinguishing traits and presenting a wealth of information concerning their geographic distribution and economic importance. When, by the end of the first semester he had not even reached the end of the Monocotyledons, it became a question in the minds of the members of the class as to whether the course was going to take two or three years for completion instead of the single academic year as announced. Nevertheless, our Professor, without seeming to curtail the vast amount of interesting material at his command, somehow managed to quicken his pace, so that by the final lecture in May, the Composites were safely tucked in. We had learned how to cook young cattail inflorescences, how to prepare biscuits from flour made from the corms of *Arisaema triphyllum*, and how to be assured of a steady supply of "winter asparagus" from the roots of *Phytolacca americana*. Also, those of us who had taken careful notes were in possession of a fine new natural key to seed plants to try out on our own students.

Botany 10 was a flower of another color. Our small class, which included G. Ledyard Stebbins Jr., H. K. Svenson and Father Louis Lalonde, spent much of its time following Professor Fernald around the Herbarium as he opened case after case and listening to his informal but illuminating discussion of such genera as *Sparganium*, *Potamogeton*, *Poa*, *Carex*, *Scirpus*, and many others. These demonstrations provided Fernald with an opportunity for pointing out diagnostic characters and emphasizing the criteria which he employed in his monographic and revisionary studies. In this manner the student learned how to tackle a difficult taxonomic group as well as how to use the literature. Always, however, there was the healthy insistence, so well exemplified by Fernald's own procedures, that herbarium work must be supplemented by study in the field.

On of the most delightful episodes of Botany 10 occurred during a three or four week period when the class sat with Fernald around a table in the Library and watched him leaf through the Gray Herbarium's priceless collection of autographs and por-

traits¹ of botanists. Ascherson, Engler, Grisebach, Sir Hans Sloane, the Bauhins, Engelmann, Boott, Steudel, Pringle, the Hookers, Tuckerman, Solander, Willdenow, Rafinesque, Torrey—these and a host of others passed before us in review as Fernald commented on their lives, their travels, and their more important contributions to botanical literature.

In the latter part of the course—and here, it seems to me, he was at his best—Fernald discoursed on his own explorations and expounded his views on such significant and often controversial matters as the persistence of plants in glaciated areas, the effects of coastal subsidence on the distribution of plants, the origin of the Coastal Plain flora, and the high degree of endemism around the Gulf of St. Lawrence. These discussions, in which the members of the class were invited to participate, were highly stimulating and furnished a striking example of the sweep of Fernald's mind coupled with his mastery of detail.

The prosecution of my own piece of work brought me into almost daily contact with Professor Fernald, to whom I never appealed in vain for assistance or advice. My primary task of determining many hundreds of specimens collected on the Elizabeth Islands gave rise to a multitude of questions, especially in dealing with critical genera, and although Fernald seldom revealed his judgment as to the identity of this or that specimen, he invariably directed me to sources which, if properly utilized, yielded the correct answer. This I conceive to be a distinguishing characteristic of a truly fine teacher.

Anyone who has ever worked in the Gray Herbarium will recall Professor Fernald's custom of reading aloud to all and sundry any manuscript on which he happened at the moment to be working. During much of the time that I was in residence there, Fernald was preparing his great paper on the linear-leaved species of *Potamogeton*. Stebbins and I occupied adjoining tables in the New England Botanical Club Wing, and as Fernald in his reso-

¹ This collection of autographs of botanists, botanical collectors and patrons of botany, was started by Asa Gray during his first visit to Europe in 1839, Mrs. Gray adding to it extensively during Gray's life and after his death. A supplemental collection was given to the Gray Herbarium in 1890 by Isabella B. James. The latter contained autographs of a remarkable number of early American botanists. The entire collection, including not only autographs, but biographical notes, letters and often portraits, was arranged and mounted in five large volumes under Mrs. Gray's supervision. These she presented to the Gray Herbarium in 1898.—R. C. R.

nant tones read portions of his manuscript to each new visitor, we came to know sections of this work almost by heart. Indeed, so familiar were we with the text that when Fernald was interrupted or halted for breath, Stebbins and I would continue to intone, verbatim, the ensuing sentences and paragraphs. This willingness to share with others the results of his labors is one of the attributes which made M. L. Fernald such a stimulating companion in the classroom and in the field. It was my further privilege almost daily to accompany him and, during his all too rare visits at that time to the Herbarium, Mr. C. A. Weatherby, to lunch, at which time systematic botany was the sole topic of conversation, with Fernald leading the discussion. Few botanists known to me have been characterized by such singleness of purpose and whole-hearted devotion to their subject.

It is not my function to speak further of Fernald as a companion in the field, but I cannot refrain from stating that subsequent explorations with him in Newfoundland, southeastern New England and the coastal plain of Virginia served only to confirm and strengthen the impressions gained on my first trip in 1926 and combined to provide a rich and rewarding background of experience, which, in a spirit of everlasting indebtedness, I am happy to acknowledge.

In 1865, William James accompanied the great Louis Agassiz on an expedition to the Amazon. In writing to his father about the leader of the party, James said, "No one sees farther into a generalization than his own knowledge of details extends, and you have a greater feeling of weight and solidity about the movement of Agassiz's mind, owing to the continual presence of this great background of special facts, than about the mind of any other man I know . . . I see that in all his talks with me he is pitching into my loose and superficial way of thinking." It is the opinion of at least one of his students that this estimate might with equal validity be applied to Fernald. Intolerant of slipshod methods, acidulously critical of all that he considered mediocre, yet ever ready to praise the results of painstaking and conscientious work, M. L. Fernald's influence as a teacher extended far beyond the confines of the classroom and did much to raise the standard of descriptive systematic botany in this country.

FERNALD AS A REVISER OF GRAY'S MANUAL

HARLEY HARRIS BARTLETT

BEFORE entering college I wrote to Professor Fernald from Indianapolis asking if a Freshman who was already keenly interested in botany would be allowed to take his course "Botany 7: The Flora of New England and the Maritime Provinces of Canada." The answer was "Yes," for those were the good old days of President Eliot and free election, when any student could enroll in any course if he could persuade the professor to admit him. There never was an educational policy better adapted to professors and students who liked to do as they pleased! After poring over all the college catalogues available, I had decided that nowhere else was there a course like Harvard's "Botany 7." How amazingly true this proved to be I soon discovered, for Fernald was as extreme an individualist in teaching as he was in his scientific work. He worked in such flares of enthusiasm that whatever engaged him at a particular moment was for the time being the most important thing in the world to him, and so it had to be to his students. There were only two of us that year (1904-1905) and we were guinea pigs on whom his ideas were tested out. As for background, he seemed to assume that if we didn't already know the minute distinctions among all the species he talked about with such glowing enthusiasm we soon would, and since he referred to *Carex* so frequently, his monograph "The Carices of the Section Hyparrhenae" was soon fixed upon as an exemplar for method and systematic concepts. These particular sedges, it would seem, must illustrate all truly important botanical phenomena and types of geographical distribution in North Eastern America, and it would be a long time before any other region need concern us! Fernald took me to an old wooden case where the reserve numbers of the "Contributions from the Gray Herbarium" were kept, got out a copy of the most important one, that on the *Hyparrhenae*, inscribed it to me, told me that he had also written a big one on the genus *Salvia* in Mexico, but that it was really far inferior, because he had never seen the plants in the field, and, anyway I shouldn't be concerned with Mexico. A firm teacher-student friendship was at once established between Fernald and myself, for he became

and remained my favorite professor. He was inclined to think well of people from Maine, other things being equal, and since both his mother and my father had been born in Bethel, Maine, I was only a generation removed, which made a certain bond that nobody but a down-East Yankee might recognize!

Many who did not know Fernald well too hastily concluded that his predominant traits were vanity and acrimoniousness. This was very far from the truth. He was easily moved to intemperate expression of emotions which others with more control might conceal, but he was essentially friendly and helpful. His vast excitement over what sometimes seemed of small significance was what kept him so amazingly active and productive. In the days when I knew him best he was never assailed by doubts about the value of what he was then doing, but he was very critical of those who were doing something that he would not spend his own time doing. I remember that one time he remarked on what a disappointment Thiselton-Dyer's career had been, as Director of Kew. He said that Thiselton-Dyer had had as great a chance for a productive career as Joseph Dalton Hooker, but had frittered away his time, although his obvious duty to botany was not to waste a moment of an opportunity denied to most botanists, when he was the one, chosen from among hundreds, who had a chance to do great things. At this outburst Dr. Robinson, who was the essence of kindness and moderation, and seldom allowed himself to pass a snap judgement, was genuinely shocked, and made what was, for him, a vigorous rebuttal. The clash of personality between the two men was so great that they never seemed sufficiently compatible to work together harmoniously, and actually their co-operation in the revision of Gray's Manual for the seventh edition was negligible, consisting merely in each doing part of the work. There was no community of concepts.

Their social life was utterly different. Robinson would typically invite his friends to meet some distinguished musician at his home and meticulously observed all the social amenities. Fernald would propose an all-day Sunday tramp in midwinter, starting from some point reached by rail. Then, as he said, the swamps and bogs were all frozen over and you could see just what they were like. After tramping all day in the cold with

nothing to eat except maybe frozen cranberries from a bog, boiled in melted snow in an old tomato can salvaged from a roadside dump, he would take his guest home to a midnight repast of lamb chops only, broiled on forks over the coals in the furnace down cellar, and eaten out of hand, squatting on the floor in front of the open furnace door. On such an occasion Fernald was at his best, jolly, full of zest and good-fellowship, and infectiously enthusiastic about life in general and the New England flora in particular.

After I got acquainted at the Herbarium, it was not long before great piles of pasted-up manuscript made their appearance for the forthcoming (7th) edition of Gray's Manual, which was not actually published until 1908 but had already been long in preparation. The basic copy had been prepared by pasting clippings from the older edition, family by family, onto sheets and arranging them in the Engler and Prantl sequence. Changes had been made in almost every line at various times, so that the revised copy resembled especially foul corrected proof. Some parts were Robinson's especial responsibility and were mostly revised by him, and others were Fernald's, but either of them fixed whatever errors or omissions came to his attention.

Robinson was the more systematic worker, for he was inclined to work straight along, in the quiet of the old Gray study, dealing with the pages as they came. Not so, Fernald. He would get started on some particular species or group by finding something of interest in the course of current routine determinative work. It would lead him into a hectic investigation that sometimes fell flat but generally resulted in a big or little article for RHODORA, and the random articles provided the basis for revision of the Manual copy. So practically everything he did after about 1901 was directly contributory to the Manual, but some groups received minimal attention. He needed the stimulus of some discovery to set him off. It did not have to be a large one. Sometimes, in fact, the supposed discovery petered out, but it would have resulted in some critical determinations that helped the good cause along. So there was continual progress with the Manual but it never seemed to get done.

Even "Botany 7" had to do some small part. Our laboratory work consisted largely in trying to prepare tentative keys to

genera that had been skipped, or in testing out revised keys with current herbarium accessions, or in testing the applicability of work published after the "Manual" copy had been prepared, which might necessitate still further changes. To what extent in later years "Botany 7" continued to be a device for preliminary testing of the "Manual" revision I do not know, but Fernald was not one who readily changed his ways and it is to be presumed that the preparation of the eighth edition followed much the same course as that of the seventh.

In Fernald's early years as a staff member there were four chief continuing institutional projects at the Gray Herbarium. In addition to (1) the revision of Gray's Manual, these were (2) the continuation of the Synoptical Flora of North America, (3) the study, in accordance with an agreement of co-operation with the National Herbarium, of the numerous new collections that came to hand yearly from Mexico and Central America, and (4) the indexing of newly described systematic entities of the Western Hemisphere.

As already indicated the first of these was originally shared by Robinson and Fernald, but fell eventually to the latter; the second was Dr. Robinson's; the third was divided among Robinson, Greenman and Fernald; and the fourth had come to be exclusively Miss Day's.

Fernald's inheritance of the Manual revision came about gradually. Participation in the study of the Mexican and other tropical collections became increasingly distasteful to him, for he could not keep up an interest in floras unless he personally knew many of the species in the field, when he had not actually worked in the regions. Any species that grew in northeastern America interested him wherever it occurred, or was supposed to occur, and he would therefore spend much time studying Scandinavian specimens and publications. A region whose flora was largely dissimilar to that of the Northeast had no attraction for him.

To accord with his interest in the plants of eastern Canada the limits of the Manual region were extended northward, and for a good many seasons he worked with a succession of botanical comrades in Quebec and Newfoundland. At length, having stimulated the interest of Canadians in taking over the study of the northern border, and wishing to do his own field work where

there were the best chances for significant discoveries, he turned to the coastal plain of Virginia, where he made a multitude of interesting additions to the flora of the "Manual region." At the close of each field season he returned to the Herbarium with keenly whetted enthusiasm for studying the new collections, and the idea of doing anything unrelated to that seemed almost intolerable to him.

It was part of the routine of the Herbarium to identify the tropical collections as such. Then, at length, after isolated species had been described in a genus, and sufficient material seemed to have been accumulated, an effort would be made by a staff member or student to prepare a comprehensive revision. The annual collections of Pringle and Palmer were the chief dependence for progress in the somewhat vaguely defined tropical American project, but there came to be more and more field workers, such as Millspaugh and Gaumer, in Yucatan, C. C. Deam, in Mexico and Guatemala, Peck in British Honduras, John Donnell-Smith and his associates in Central America, Rose and associates, mostly in Mexico, Lumholtz in Mexico, and not a few others. The effort to make some current systematic disposal of all this material often required that species be described not by systematic revision of a mass of material but from single specimens, the distinctions of which might or might not hold up in the light of subsequent collecting.

This work on miscellaneous tropical plants engaged much of Fernald's attention until about 1901 when he practically declared his independence of it. This restriction and unification of his interests were clearly in the best interests of the Gray Herbarium. The New England Botanical Club contained many of the best friends of the Herbarium, who did whatever they could, financially and otherwise, to support it. Financial support was never sufficient and although the Gray Herbarium was one of the most eminent and deserving of Harvard departments, it led a somewhat hand-to-mouth existence and had to beg of its friends in order to carry on any kind of a worthy program. So it was essential not to fail to serve the local constituency of those who were primarily concerned with the local flora. In botany Harvard's policy was then, as it still remains, to belittle its own best achievements and to disregard its most valuable resources

and traditions in building for a glorious new future. So the Herbarium, then and subsequently, had the problem of finding in large part its own sustenance, with little aid or encouragement from the top echelon.

In providing for successive editions of Gray's Manual, Harvard, however grudgingly, has performed an important national educational and scientific service. Fernald was an inspiring leader of local flora investigators and during four decades botanists looked forward to the appearance of the new "Gray" as an event of genuine importance, as it was. One of Fernald's botanical colleagues of many years standing, Professor Bradley Moore Davis, has well expressed what many of us feel about Fernald's constant devotion for over forty-five years to revision of the Manual. He wrote in a recent letter: "Fernald's death brought to close a well ordered life that followed a consistent pattern, to the end that he accomplished much."

In its early years the New England Botanical Club was an enthusiastic organization, largely of amateur systematists and of professional botanists whose interest was not chiefly systematic, but whose attention to various local floras or incidental collecting turned up many problems that could best be referred to the staff of the Herbarium.

Fernald was ready and willing to act as a central consultant for this large group of botanists, which soon extended far beyond the membership of the club. By the time the eighth edition of the Manual was completed, he had had cooperation to some degree from about 400 collaborators, whose problems and questions all had to be reasonably answered by his investigations. Probably no botanical systematist had ever before gone so far in satisfying so many active finders of deficiencies and faults in a standard flora!

Fernald's concentration on plants of the "Manual" region began with his early work on the local flora about Orono, Maine. His first botanical correspondents, John Parlin and Kate Furbish, established the type of relationship that later extended to correspondents far and wide. His enthusiasm for regionally restricted floristic study was so boundless that it sometimes impressed others as ludicrous or boring. Published expression of it probably reached its height in an advertisement which he wrote for

the Bangor and Aroostook Railroad, published (anonymously!) in RHODORA for April 1903. Never before or since has there been such an advertisement, which should by all means be included in a bibliography of Fernald's writings. There have been many railroad and steamship blurbs directing the attention of tourists to such natural wonders as the big trees of California or the hot springs of New Zealand, but surely even the botanical traveller had never before been invited by a railroad in an advertisement of four pages of fine print to patronize its facilities in order to see such astounding treasures of Maine as the "rare *Carices*, *C. tenuiflora*, *gynocrates*, and *vaginata*, or the little sundew *Drosera linearis*." On the upper Mattawamkeag the botanist was promised no less than "the white foam-like masses of the spicy Labrador Tea, *Ledum groenlandicum*, rich rosy banks of the Pale Laurel, *Kalmia glauca*, indefinite white waves of the Alpine Cotton-grass, *Eriophorum alpinum*, brightened here and there with the deep yellows of *Cypripediums*." Nor must he fail to look below the surface, for, in the Piscataquis and the Mattawamkeag, would be found *Myriophyllum Farwellii* and *Potamogeton obtusifolius*! Elsewhere the visitor would thrill at the sight of "the largest of the Rattlesnake Plantains, *Goodyera Menziesii*, the rare Arctic Fleabane, *Erigeron acris*, the remarkable local Wood Betony, *Pedicularis Furbishiae*, unknown outside the St. John Valley." Finally, if these and other delights should pall, the prospect of even greater adventure was held out, for "the botanist whose good fortune takes him to the upper St. Frances may watch with hope for *Pleurogyne carinthiaca*, *Eriophorum russeolum*, *Astragalus elegans*, *Parnassia palustris*, *Saxifraga caespitosa*, *Anemone parviflora*, *Cornus suecica*, *Pedicularis palustris*, and many other arctic plants known closely to approach northern Maine"! I know nothing in botanical literature with quite the flavor of this advertisement except Bartram's "Travels." It would warm the cockles of any botanical heart.

Fernald's enthusiasm was literally unbounded when he had made or thought he had made some discovery, whether in the field, or among his own collections, or those of his correspondents. The moment anything came to light that seemed to require the segregation of a new species or a revision of the accepted delimitation of some group, he would immediately start sorting the

material of the Gray Herbarium into piles. In his earlier days, at least, he seemed to have a sublime trust that all essential material would either be ready at hand in the Gray Herbarium or that a problem insoluble with its then available resources could well wait until he had personally seen to the collection of new specimens. He rarely borrowed from other herbaria except



FERNALD AT WORK IN THE GRAY HERBARIUM.

for the utilization of what might be at hand in the collections of the New England Botanical Club. As for the Herbarium of the Arnold Arboretum, it might as well have been in Timbuctoo as in Jamaica Plain, so far as any utilization of it during my five years in Cambridge was concerned. During that period, I believe I am correct in stating that Fernald did not once visit the Arnold Arboretum, nor did his colleague Robinson more than once, and then not with a botanical objective.

Like many older herbaria, the Gray Herbarium in the pre-Fernaldian era had been developed to conserve space and costly paper by gluing specimens supposedly of the same species to the same sheet, quite regardless of geographic origin. This exasperated Fernald beyond measure, for it made it impossible to sort specimens into piles, first by one characteristic and then by another, or geographically, with the ceaseless industry that was Fernald's when he was intent upon a problem. So many a time

he started work on a genus by snipping all the mixed sheets to pieces, which he strewed in apparent unconcern all over the big central table in the main herbarium room, where he always worked. Dr. Robinson would come in, look with consternation and anguish at the wreckage, allow himself to remark gently that he wondered "how anyone could ever again interpret the concepts of the Synoptical Flora," and retreat from the painful sight into the old Gray study. (Among the Harvard botanists of the time Robinson was the chief exponent of the soft answer that turneth away wrath.) Then Miss Anderson would gather up and patiently glue all the severed fragments onto new whole sheets, but with each specimen by itself.

Fernald's technique, in those days, at least, was not to make notes and study those until he arrived at a classification of specimens that satisfied him. There was no tabulating of data. Nothing would do but interminable rearrangements of the specimens themselves. Once when Dr. Robinson mildly suggested that much deterioration could be prevented by sorting notes instead of specimens he retorted indignantly that one who had a *feeling* for the importance of *habit* would never be satisfied to handle notes instead of specimens. "Could you," he said, "see something you had quite overlooked before if you were just sorting cards?"—and the argument was unassailable. Even when sorting specimens by measurements of some organ he seldom, if ever, recorded each measurement and subjected the data to even the most rudimentary statistical analysis. Rather, he decided upon some measurement that might set the best limit between two groups, and sorted his material as "greater" or "less" than that. If the separation by a single critical measurement of a mass of material into two piles failed to correlate with other criteria of distinction he simply tried again with a new measurement.

Even though Fernald was prone to be satisfied to come to conclusions by examination of only the material that was at hand, he was indefatigable in making some disposition of every specimen that he had, down to the poorest. He was not one to pick out a single apparently distinctive specimen and describe it as a type, hoping that time would confirm his judgement. He was unsparing in caustic criticism of persons who would propose a

new species, or even a variety, without making a decision about the identity of every other related specimen at hand. Whatever may be thought of Fernald's segregations, they were proposed after making a conscientious identification of every related specimen that he had, according to his own criteria. He was especially suspicious of proposed systematic entities that did not seem to have a consistent or logical geographic distribution, and having to interpret or recognize one of Greene's numerous species, based upon a single specimen, caused him extreme indignation.

He was therefore sometimes vigorous in his denunciation of his own earlier work on the Mexican species of *Salvia*. He never referred disparagingly to "species" of *Salvia* however, except when hearers had a shrewd suspicion that they would get his meaning more correctly if they mentally substituted "Eupatorium" or "Crataegus" for "Salvia."

In his talks to students Fernald was often quite intemperate in his criticism of other botanists. On one occasion when he saw written down in our notes some of the disparaging remarks he had made about botanical colleagues at various institutions he was deeply chagrined and apologized for having gone so far. As he warmed to his subject, however, he was soon very nearly back to the point of departure. Still, he had a very generous appreciation of many other botanists. He generally referred to Bicknell's work on *Sisyrinchium*, for instance, with commendation, but had a very low opinion of Burgess's work on *Aster*. It caused him a pang when he had to admit the validity of certain of Green's propositions in *Antennaria*, or Nash's and Ashe's in *Panicum*. Fernald's denunciations of other botanists and their work were not often intended to hurt, however, and after he himself had forgotten making them, were quite as likely as not to be followed by friendly and appreciative expressions.

A good example was given by his reaction to Kükenthal's work on *Carex*. At first sight he thought it magnificent. On second sight he found it full of exasperating errors, which he condemned roundly. Then he thought that what the worthy pastor needed was to spend a year in Cambridge as his guest, learning American geography and examining plenty of American material. But Kükenthal couldn't come. "Then he isn't much of a botanist

anyway, if he doesn't accept a chance to correct his errors, and would rather just let them go," raged Fernald, and condemned the whole breed of Germans in general for gross carelessness, and Kükenthal in particular. Then finally he arrived at the conclusion that Kükenthal had done a fine job after all but had made sundry little errors, that he, Fernald, might quite calmly rectify himself! One German of whom he always (that is, *nearly* always!) approved was Buchenau.

Nearly every investigation, large or small, that Fernald undertook in the interval between the two last editions of the "Manual" may be considered a preliminary study for the eighth edition of that work, but was promptly published in RHODORA. This journal afforded him an outlet for one or more articles, critical reviews and notes each month, from the very beginning, the whole representing a prodigious amount of writing. As time went on, this journal became more and more an expression of his personality and views. Sponsored by the New England Botanical Club, in which Fernald's strong personality was dominant, it early came to be one of the most highly personalized of scientific journals, in an era in which most editors have deemed it scandalous to reveal any personality at all.

In the early days of RHODORA there was an annual meeting of the Club at which the editorial board of an imaginary "Rhodorella" made a report that tingled with satire and fun. It was much in accord with Fernald's impulses to express himself with an informality and freedom that seldom appear in these stodgy and formal days. So the reviews in RHODORA were sometimes almost as spicy as they might have been in Rhodorella!

Since Fernald's prejudices were so strong and so unsuccessfully inhibited it is quite understandable that he did not keep every trace of his personality out of the "Manual." For example, he had no use for spurious common names, made by translating scientific names into English, and had the courage of his convictions in refusing to adopt them in the Manual. The sheer pedantry of "standardized common names" got no encouragement from him. He required that common names, to be admitted, must belong to common language, not merely to an artificial jargon. It is greatly to his credit that he was content to be considered reactionary in this respect. He was likewise

reactionary to a certain extent in disregarding some of the technical jargon that distinguishes newer developments in systematics. It is just as well. There is much pomposity and verbosity in science nowadays that has little if any utility. Fernald worked from the end of the period in which systematics dominated botany, through a period in which systematics seemed old-fashioned and on the wane, and into a new period in which systematics is being revitalized by the experimental investigations of geneticists, cytologists and biochemists. Methods of investigating relationships are becoming more and more critical and time-consuming. The days of dependence in distinguishing species upon intuitive perception of the integrity of an assemblage of characteristics may be thought to have passed. If, however, we consider the need for comprehensive works on large floras, the small number of botanists to do the world's vast botanical work, and the inadaptability of many plants to experimental investigation, then Fernald's life work in the honorable "Old Systematics" will be seen to have a value that the passage of time will not soon efface. In view of the application of experimental methods in an increasing number of groups, it becomes more and more apparent that the time during which one man can come to have a critical knowledge of most of the flora of a region as large as that of Gray's Manual has passed. So his book will be a lasting landmark in the botanical history of our region. It is a source of deep satisfaction to his devoted botanical following that he lived to see it in print.

As I have said elsewhere, "the new Manual is a highly satisfactory and noble achievement, the culmination of a lifetime devoted to the reinterpretation of our flora, as largely on the basis of zealous personal field work as half a century would permit."

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FERNALD AS A BOTANIST

REED C. ROLLINS

SELDOM is it possible to say in truth that a man's life was his work. But such a statement seems not an exaggeration when applied to Merritt Lyndon Fernald. Even during his last years he worked with aggressive intensity, and it seemed to those around him that he hurried as if to forestall the lengthening shadow of age that was so incessantly compressing the time left to complete the tasks he had set. His hours of labor at the herbarium daily were extended into the night at home. A mild thrombosis, which he suffered on two occasions, scarcely slowed the tempo of the writing that had flowed from his pen like a torrent for half a century. At work, he rarely stopped except to read aloud from his writings to almost anyone who chanced to be near. Scarcely a visiting botanist to the Gray Herbarium departed without having been "read to." He seemed to evolve clarity of expression from reading aloud and on each occasion would busily correct or annotate the manuscript. Perhaps the dominant influence upon his professional work were his tremendous industry and a strong devotion to taxonomic botany.

Professor Fernald's career formally began immediately after graduation from college but it might be appropriately calculated from his first publication in 1890. Possibly because of his own early interest in natural history, he was a strong believer in the dictum that "natural scientists are born, not made." His first studies were "in the field" and he was fortunate enough to maintain a satisfactory balance between field and herbarium studies throughout his entire career. His life was largely devoted to an intensive study of the higher plants of temperate eastern North America. He knew the plants of this area intimately and could relate an interesting story about nearly every species. From the point of view of his students, some of his greatest moments were undoubtedly those spent on the shores of a pond on Cape Cod, or perhaps on a mountain slope in Newfoundland, where he would give a keen analysis of the principal characteristics of a plant in hand and then proceed to recite the points of distinction from closely related species, geographic ranges, and comparative usefulness to man. Such an unrehearsed performance could be ex-

pected many times in the course of a day in the field and never failed to elicit admiration for the well-ordered mind from which it came.

By far the largest amount of Fernald's published work concerned questions of the identities, accurate definition and geographic distribution of a wide range of vascular plants. He placed chief emphasis upon that aspect of taxonomic botany sometimes called floristics. Early in this work he discovered that the older botanists had not been too careful about checking and properly correlating the names in use with the specimens upon which they were originally based. The type concept had not been accepted then and they considered this unimportant. Since the plants of eastern North America had largely been distinguished and described by European botanists, Fernald often turned to the classical specimens preserved in European herbaria for authentic comparative materials. He was careful about going back to the type specimens for the verification of species concepts. On two occasions, in 1903 and again in 1930, he studied in various European centers for this purpose, but photographs of types played an important role in providing the basis for direct comparisons. In an earlier day, Asa Gray had studied many of these collections and in his own masterful way had set the pattern for subsequent workers. But Gray was not a field botanist and did not have at his command an intimate knowledge of many of our wild plants in their native haunts. As a result, there remained many problems for one of Fernald's talents. He knew the plants in the wild and with adequate collections of herbarium specimens to study in the laboratory, he was able to properly collate for the first time numerous species with their original descriptions and the specimens upon which they were based.

Gradually Fernald established himself as the leading authority on the flora of eastern North America and undoubtedly the pinnacle of his prestige among botanists of the world was reached upon the publication of the Eighth Edition of *Gray's Manual of Botany* in July, 1950. The rewriting and expansion of this century-old classic had absorbed a major portion of his energies for over fifteen years and he had been preparing for the task for a much longer time. As a young man he had collaborated with

B. L. Robinson in producing the Seventh Edition, published in 1908. But he had always been highly critical of that work and often remarked that it was done by a "specialist on the Compositae and a young man who knew nothing about the Flora." All will agree that during the more than forty years following his first participation in a revision of "the manual" he certainly corrected this deficiency. The Eighth Edition of *Gray's Manual* stands as a crowning achievement to a long and very active botanical career.

The results of much solid revisionary work were frequently interpolated into papers which otherwise dealt largely with floristics. But Fernald produced at least one large monograph that was a model of its kind.¹ In an extended review of this work W. H. Pearsall² writes as follows: "To students of the genus *Potamogeton* the publication of this excellent and exhaustive monograph is an event of outstanding importance. To British workers in a more restricted area it has always been a matter of surprise and regret that, with the exceptional facilities afforded by the great lakes and waterways of North America, no adequate attempt has previously been made by an American to critically study their Pondweeds. However, this reproach has now been removed, and we heartily congratulate Prof. Fernald upon the thoroughness, accuracy, and scientific value of his work. In our judgment the volume before us is superior in many ways to any existing account of the *Potamogetons* of this section."

Fernald was much interested in the distribution of the species of plants in space as shown by the frequency with which he dealt with this subject in his writings. This interest led ultimately to what are undoubtedly his most important generalizations in biology, for which he will be longest remembered. These generalizations grew out of an intensive study of floristic ranges. Early in his career, while exploring for plants on the Gaspé Peninsula and Newfoundland, he and his associates discovered numerous isolated species common to this region and the arctic, western America, the Atlantic Coastal Plain or western Europe. Later, similar discoveries were made in other areas of eastern

¹ The Linear-leaved North American Species of *Potamogeton*, Section *Axillares*. Mem. Amer. Acad. Arts & Sciences 27: 1-183. 1932.

² The Botanical Society and Exchange Club of the British Isles, Report for 1932. Vol. 10: 51-57. 1933.



FERNALD WITH HIS CLASS ON CAPE COD, 1938.

Photo by W. H. Hodge

North America. How to explain the disruptions in the ranges of these plants was the question he tried to answer. As succinctly written by Professor Raup,³ "His most important work in the field of phytogeography probably was summarized in his paper, published in 1925, on the persistence of plants in unglaciated areas of Boreal America. In this paper he discussed the many enigmas of discontinuous range patterns manifested by so many plants in northeastern America, and, in so doing, presented a vast amount of specific evidence in support of the theory of persistence which had been so ably defended by Darwin. His work in this field has greatly stimulated research in two directions. One of these is in the re-examination by glacial geologists of the probable behavior of the Pleistocene ice in eastern America. Controversies raised in this connection still obtain. In another direction have been investigations of the inherent capacities of species to migrate, particularly as related to their genetic constitution and history. It is not impossible that in reemphasizing the theory of persistence and in stimulating studies of its modern implications, Professor Fernald has made the largest single contribution to phytogeography since Darwin."

Aside from his writings in taxonomy and phytogeography, Professor Fernald wrote entertainingly of his botanical expeditions to the Gaspé Peninsula, Newfoundland, and Virginia. These were journal accounts combining field botany, travel and many human interest incidents, all blended to give to the reader an extraordinary picture of a "botanist on location." His wide interest in the relationship of his own specialties to practical matters is demonstrated in a number of ways. For example, as mentioned in the preceding article by Professor Pease, one of his books, written with Professor A. C. Kinsey was entitled *Edible Wild Plants of Eastern North America*. Another instance is his participation as a consultant in the Labrador-Newfoundland boundary dispute argued before the Privy Council in London by the governments of the Dominion of Canada and the Colony of Newfoundland in 1926. His evidence that maritime plants found in the region of Hamilton Inlet extend westward to the head of Lake Melville was a decisive point in support of the territorial claims of the Newfoundland Government. A third

³ Merritt Lyndon Fernald. *Harvard University Gazette* 46: 78. 1950.

instance was his participation in a lively discussion concerning the location of Wineland the Good. When he learned that some of the important evidence for locating the point of discovery of the North American continent by the Norsemen in Nova Scotia or New England was botanical, he immediately examined this evidence. Some of his conclusions, not necessarily concurred in by philologists and others, were that the wild grape or "vinber" of the Norse was probably mountain cranberry (*Vaccinium vitis-idaea*) rather than our Wild Grape (*Vitis labrusca*) and that their "self-sown wheat" was more probably Strand Wheat (*Elymus arenarius*) than Wild Rice (*Zizania aquatica*) as others contended. As a result of his studies, he was convinced that the old Icelandic sagas referred to Norse landings far to the north of New England or Nova Scotia, most probably along the Labrador coast.

As an editor and editor-in-chief of RHODORA for many years, Professor Fernald handled many botanical publications sent in for review. These stimulated him to write critiques and reviews, many of which have become classics of their kind. Often he would become exasperated when handling a manuscript or paper not meeting his standards of excellence and sometimes their authors would receive a verbal spanking. On one such occasion he was heard to remark "Yes, ——— is a nice chap. His heart is in the right place. Wish I could say the same for his head." Certainly the whole man as a professional botanist would not stand inclusively touched upon were his role as a botanical critic not further mentoned. But here I turn to Dr. E. D. Merrill where in his citation of Professor Fernald at the presentation of the Leidy medal he has ably handled this aspect in the following words: "Fernald's published papers on various phases of botanical science exceed 700 [now over 750] in number. These, always highly critical, carefully prepared, well written, and full of the results of very keen observation, set an unusually high standard within their field. His trenchant criticisms of the work of others in the general field covered by his activities, while not always pleasing to those criticized, assist in maintaining the standards of American botanical scholarship. On one occasion when one of my former associates was requested to review a certain published paper, which was not all that it should have been, I heard him exclaim, 'Oh, for the pen of a Fernald.' In

practice, if an individual criticized attempts to maintain his thesis, that individual must be very certain of his ground."

Professor Fernald's has been a many-sided contribution to botany in spite of his ostensibly specialized field of activity. Throughout his work he was imaginative and had the stamina and singleness of purpose to follow through in his research studies to their logical fruition. His published work stands on its own merit but botany has lost an ardent and sometimes militant individualist of great vigor, keen insight and strong devotion to his chosen field.

FERNALD IN THE FIELD

LUDLOW GRISCOM

MANY people intensely enjoy watching others do something superlatively well. This enjoyment is greatly enhanced should the technique or field of activity impinge on one's own interest and requirements. It is part of a happy and very fortunate life that it has been my privilege to be afield with the world's greatest field botanists and ornithologists, and I have reflected for some time on the combination of assets and talents required to produce such an exceptional human being. In the ensuing discussion it must be understood that my friend, the late M. L. Fernald, possessed the necessary qualifications to an astonishing degree.

The principal objective of the field botanist is to find and collect in quantity plants of some critical or scientific interest. This obviously involves getting away from civilization and disturbed areas, and may even involve protracted camping, mountain climbing, or the organization of a real expedition, with numerous personnel, guides, porters and problems of transportation. This presupposes the necessary rugged *physique*. The legs must be stout, the back must be strong to carry a pack, the wind must be good, and *the eyesight must be remarkably keen*. Fernald might be described as a short, stout man, with short legs. In the Shick-shock Mountains of Gaspé I had occasion to marvel at his ability to cope with the demands made on his physique, and at the same time, to feel very sorry for another old friend and companion with short legs, the late K. K. Mackenzie, whose heart could not stand the strain of mountain climbing, soon to die prematurely

of this defect. Fernald's keenness of eyesight was prodigious. By train his face was glued to the window, by car he hung as far out as safety permitted, constantly scanning the passing banks and roadsides, calling "stop" when something suspicious was sighted, and usually to good purpose. This was his pet method of turning up unusual weeds. It is trite to mention his indifference to extremes of heat, cold, wet, and insect pests.

Another must for a great field botanist is a memory for facts, so fabulous as to be completely beyond the capacity of the average person. Most local floras involve 2000 or more species. Think of the facts involved in committing to memory, almost perfectly, the characters in the descriptions of such a flora, even the most technically difficult genera such as *Viola* and its hybrids, *Carex*, the willows (*Salix*) in the far northeast. Moreover, the ranges must be accurately recalled, so as to pounce at once on any possible range extensions in the field. To illustrate, I remember one mortifying incident. Long interested in orchids, I was, so I thought, very familiar with *Habenaria Hookeri* Torr., so when I picked some, up in Gaspé, I thought little of it. But you should have seen Fernald jump when I mentioned it; he immediately recognized it as a range extension and made me go back to relocate the station to procure more material for the whole party!

Few people stop to think that a sense of location or place-memory is a great asset. Fernald had one of the most marvellous of any human being I have ever known, and his ability to return after many years to the station of some rare plant bordered on the incredible. Two illustrations must suffice. On the table-top of Mt. Albert I was particularly anxious to "clean up" on the great and local rarities, notably *Polystichum mohrioides* (Bory) Presl var. *scopulinum* (D. C. Eat.) Fern., the only eastern station. Speaking to Fernald, whose generosity and interest were notable, he reflected a moment. It required *crossing* the entire *tableland*, to find the right gulch or ravine on the opposite face of the mountain, where he had been once previously. Crossing the mountain and hitting the first gully by chance, Fernald said "wait a minute," and disappeared downwards, shortly to reappear, saying it was not the right one and he believed the one we were seeking was further to the left. So, to the left we tramped

and the next gully "began to look right." We were told to look for a big patch of July snow. There *was* such a snowpatch, and in a few minutes Fernald relocated the famous station. Only once did I see Fernald at fault. I had never collected *Scirpus Peckii* Britt., and recalled a sheet in the Gray Herbarium collected by Fernald at Alstead, N. H. He claimed to remember it well and volunteered to make a try at finding the station. So one day we took a long and rambling trip around the changed village of Alstead, while Fernald tried to recall the location of a moist swale, one of many in the hollow of some farming uplands. It could not be done. The point is that Fernald was clearly chagrined and mortified, in spite of the fact that *thirty-five* years had passed. I could not console him on the way home as he felt he had completely wasted my day, and he earnestly promised to make it up to me. He did, bless him, over and over again.

Long before I met Fernald or was in the field with him, I knew him by reputation as the great authority on the flora of New England, the Maritime Provinces of Canada, and Newfoundland. I therefore expected and was prepared for all the assets and qualifications outlined above just as I had found them in the late Dr. Karl M. Wiegand, who was just as sensational in his knowledge of the flora of the Cayuga Lake Basin, a more restricted area. The great question now arises, how does such a person perform in a new or unknown flora? This I was able to answer, as I was largely responsible for getting Fernald out of New England and well started on his field work in extreme southern and southeastern Virginia, handicapped as he was by having by-passed the famous pine-barren flora of New Jersey. One fine morning we left Cambridge at 5:30 a. m. and rolled the car on the ferry that night at Cape Charles, Va., 605 miles south. The results of the trip were written up in RHODORA, Vol. 37, under the title "Three days botanizing in southern Virginia." This field work, which continued with the aid of the greatly gifted Mr. Bayard Long, was delightfully written up in RHODORA, with many revisions and range extensions into the Manual area. Here we reach the final asset of a great field man, who does not know the flora, and who has never seen the plants growing before. The gift of a somewhat photographic memory combined with extensive reading plus the study of herbarium specimens, enabled

Fernald to recognize, spot, or at least suspect most of the well known southern element.

How well I recall joining a party in northern Newfoundland led by Fernald and Wiegand. There was a pleasant party rivalry at the time, each trying to spot the most novel, new, suspicious or interesting plants per day per trip. Wiegand did not do very well, and confided his chagrin to me, a former student, privately. Wiegand's summing up was perfectly fair, just and reasonable: "He did *not* know the arctic flora," and had had no time to study or bone up on it. One graphic illustration of the opposite faculty occurs to me. While the point could be debated among botanists indefinitely, it has always seemed to me that the hardest plants to "spot" are certain low growing shrubs minus flowers, buds, or fruit, when they become as nearly characterless as possible. Such a plant is the rare and local *Stewartia Malacodendron* L., minus the huge showy flowers or the prominent 5-locular capsule. I was just good enough to "spot" this low shrub in the rich welter of vegetation in a moist ravine of southern Virginia, and called it to Fernald's attention. I was electrified when he gave a cry of pleasure and immediately named it! I still haven't figured out how he did it!

In the field Fernald was noted for a kindly, sunny cheerfulness of temperament, good humor, a tendency to bad puns, and an optimism which sometimes discommoded his party. The guides and boatmen proved to be mortal and human, the landlady and food were not as wonderful as represented in advance, in short, the Golden Age was never quite attained on my last trip with him! He was kindness and patience itself to a ham amateur ornithologist like myself, but an unsparingly caustic critic of all entitled to be called botanists. In certain ways he was almost amazingly modest and unconscious of his gifts. Thus his discoveries in southern Virginia, far from puffing up his self esteem, were invariably represented as a reflection on the lack of energy and drive of the Washington, D. C., botanists, who "could have run down there in a day anytime they got around to it."

Actually it should be clear that this greatly gifted field botanist can be described as a one-pointed, one-sided botanical machine. Fernald lived, thought, and talked botany. In very bad weather, he would invent work with the presses, changing the driers, etc.

If there was nothing to do, Fernald would pick up a novel and in half an hour was sound asleep! I never knew him to finish one! The impact on other people was entirely a measure of their interest in or knowledge of botany. It went hard with them indeed if both were inadequate, and under the inevitable strain and fatigue they tended to lose sight completely of the great gifts their leader possessed so outstandingly. In addition to the strain of camping life, the constant physical exercise and discomfort, there is a terrible, grinding monotony to the constant pressing of 1000 sheets a week, the changing of the driers, the straightening of the material, the psychological impact of overwhelming and irreducible inferiority of knowledge. Some people could not endure it.

Nevertheless, as I look back on my trips with him over a fifteen year period, as I thumb through the new Gray's Manual, which happily he lived to see finished and out, and as I write these lines, there are tears of gratitude in my eyes, gratitude that I had the opportunity to see him as much as I did, and get to know him so well, to appreciate his extraordinary gifts. The reason why has just come to me upon reflection. As a professional field man, he had all the qualifications I wish I had myself, but never acquired as an amateur. Hence I admire, respect, and esteem his memory, and rejoice at the vision he gave me.

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